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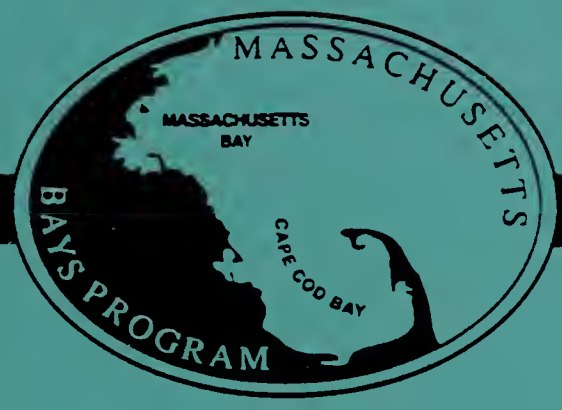

MASSACHUSETTS BAYS PROGRAM

VISIONING WORKSHOP

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JUNE 11, 1993

PIERCE HOUSE, LINCOLN, MA

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THE MASSACHUSETTS BAYS PROGRAM
VISIONING WORKSHOP

JUNE 11, 1993

PIERCE HOUSE, LINCOLN, MA

Edited by: Diane Gould

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VISIONING WORKSHOP SUMMARY

On June 11th, 1993, members of the Massachusetts Bays Program committees gathered at a "Visioning Workshop" at the Pierce House in Lincoln to address a series of questions relating to the goals and focus of the Program. In the pages that follow, the text of the plenary presentations is included, the questions addressed are reiterated and the results of each of the breakout discussions is summarized. Overall conclusions and recommendations are also provided. Appendices include the notes taken at the breakout sessions. Implementation of the recommendations arising from this workshop is the next challenge before the Massachusetts Bays Program.

TABLE OF CONTENTS

Page

5 **I. Introduction**: Bringing the Mass Bays Program into Focus: Our Goals for the Day (Diane Gould)

II. Comparative Risk Assessment

8 A. A Brief Orientation on Comparative Risk Analysis (Charles Menzie)

9 B. Using Relative Risk to Set Priorities for the Bays (Matt Liebman)

III. Morning Concurrent Breakout Sessions Summarized

20 A. Comparative Risk: Follow-up discussion of methodology, results and data gaps.

22 B. Resource Management Issues Confronted at the State and Local Levels:
Who is responsible for resource management?
What are the barriers to successful resource management?
What tools are needed for successful management?
What are some strategies for success?
Where will the money come from?

25 **IV. Afternoon Concurrent Breakout Sessions Summarized**
All Groups Addressed the Following Questions:

What criteria should we use in setting priorities for action? (e.g., likelihood of success, public perception, relative risk, economics, etc.)

Based on the above and the information we have now, what are our priority issues?

Are there issues we have overlooked?

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Page

What issue/s should the MBP be most closely identified with? (e.g. the Buzzards Bay Program is strongly identified with the issue of nutrient reduction)

How do we set achievable, measurable goals within our priority areas?

What steps do we need to take to achieve our goals?

How do we measure success?

How do we focus our efforts over the next 2 1/2 years and beyond?

How do we answer the question "Why should agencies/communities work with the Mass Bays Program?

30 **V. Conclusions**

Appendices:

1. Notes from morning sessions facilitated by
31 A. Alan Hankin
35 B. Jack Clarke

2. Notes from afternoon sessions facilitated by
38 A. Alan Hankin
40 B. Andrea Cooper
42 C. Pat Hughes
44 D. Carol Kilbride

(Text of Diane Gould's introductory comments, June 11, 1993)

I. INTRODUCTION: BRINGING THE MASS BAYS PROGRAM INTO FOCUS

This past winter, the Mass Bays Program assembled a panel of outside reviewers to take a good hard look at our strengths and weaknesses. Hank Foster described the MBP as "a program still finding itself- yet on the verge of an important moment in transition...."

Two basic challenges to the MBP can be distilled from his report:

1. There is a need to "define a specific action agenda." The report states that "The role of the MBP needs to be defined internally and perceived with clarity externally."

2. The Massachusetts Bays Program must define the legacy and institution the MBP will leave as its successor.

We are here today primarily to address the first of these issues, by bringing the program and its message clearly into focus and setting priorities as we move into the second half of our five years of federal funding. The second issue (defining the legacy and institution the program will leave in place) we hope to address in the fall at the Intergovernmental Models for Resource Management Workshop).

At the National watershed conference in Virginia in March, 1000 representatives of watershed based water quality programs from all over the country came together to share successes and problems. One of the clear messages that were delivered at that conference was that successful programs have a clear focus and have set measurable goals. The goals are based on a sound understanding of the kinds of environmental improvements that are possible (i.e., they are **achievable**). They are also **measurable** - there is a way to gauge progress towards achieving the goal. For example, the Chesapeake Bay Program has set a specific goal of overall 40 per cent reduction in nitrogen entering the Bay. It is based on implementation of BMPs, and overall reduction of point and nonpoint sources of nitrogen. They made their best possible estimate in setting their target goal.

In setting their targets for improvement, the Chesapeake Bay Program did not wait until all research was completed! They moved forward knowing that they might have to change their target percentage. In fact, as atmospheric deposition data comes in, suggesting that air pollution is a significant source of nitrogen, they are responding by adjusting their target percentage.

The lessons for the MBP that came from that conference are:

1. We must understand what our goals are and be able to state them clearly to the public, to local government and to state and federal agencies.
2. We must be able to measure our progress towards achieving our goals.
3. We must clearly understand what is needed for success -what tools, whose cooperation, where funding will come from.

As we begin to **set priorities and bring our program into focus**, a there are a number of criteria we can use to guide our choices.

CRITERIA

A. Credentials

As we bring our program into focus, we should take a look at the solid credentials our program has developed over the past 4 years as leader in research and implementation in a number of areas. Our scientific research has identified sources and loadings of pollutants to the Bays, mapped the circulation in the bays, looked at transformation of PAHs in the sediments, reviewed resource values, and looked at the relative risks of pollutants.

We are currently funding studies which will enhance our understanding of: the impacts of organic pollutants on living resources, the sources of PAHs to the environment, sediment contamination, and nutrients and primary production in Cape Cod Bay.

We have ongoing demonstration projects which will assemble **technical tools** useful for embayment level management, i.e., for the
reduction of coliforms to shellfish beds, for stormwater management, and for nutrient reduction.

Through our new Bluefish River project and the collaboration with DMF, we hope to open and upgrade shellfish beds up and down the coast, by addressing sources of NPS pollution.

By focusing on areas in which our program is developing a solid base of technical information and management tools, we will enhance our credibility as a leader in resource management.

As we begin our discussions today, we are starting off with a presentation by Matt on relative risk assessment

B. **Relative risk** is another one of the criteria we can use to help us set priorities.

Other criteria include:

C. **Public perception - What issues are local communities most concerned about?**

D. **Likelihood of achieving measurable success**

E. **Likelihood of available funding for implementation**

GOAL FOR THE DAY

My hope is that, by the end of today's discussions we will have:

1. A clearer understanding of what we want to accomplish,

2. An understanding of how we will measure our success,

3. Identified what issue or issues the public will most clearly identify with the MBP (e.g.,BB Project has made nutrient reduction and opening shellfish beds high profile issues).

4. Clearly articulated why the public, local officials and state and federal agencies should work with the MBP.

It was suggested to me that I might want to set up a strawman just to fuel today's discussion. My own suggestion is that opening shellfish beds is one of the issues we should clearly identify as a primary MBP goal.

1. We have the credentials,

2. The public has clearly sent us a message that they are concerned about this issue as a "canary in the coal mine."

3. We now have a collaborative effort with DMF underway with a potential source of funding through the 319 program.

Best of luck today - I think we are all looking forward to hearing the results of our brainstorming.

II A. A BRIEF ORIENTATION ON COMPARATIVERISK ANALYSIS

Dr. Charles Menzie introduced the participants to the principles and concepts of risk assessment (traditional and comparative), to the uses of comparative risk assessment, and compared ecological versus human health risk assessments.

In summary, the major points are these:

1. Risk assessment is a tool to set priorities. Comparative risk assessment is a tool that allows you to compare these risks on some sort of common scale.

2. It is just one tool that is available to make decisions on what our priorities are. It is one of many criteria we use to set priorities. Others may include financing, economics, perception, ability to control pollutants, feasibility of action, public or actual value, etc.

3. EPA has promoted the use of risk assessment to set priorities in its document entitled, "Unfinished Business: A Comparative Assessment of Environmental Problems". EPA Region 1 (New England) has also conducted a comparative risk project. For example, the Region compared the several problem areas for human health risk, including: criteria air pollutants (ozone), lead and radon. Ecological risks included acid deposition, all discharges to surface waters, habitat loss and accidental releases.

4. Definition of risk. Although the term is used loosely here, we also need to know the absolute risk. A comparative risk project should also give us a sense of absolute risk. For example, is there actually a risk of getting cancer from eating contaminated seafood? Also, bear in mind that we are talking about residual risk, defined as risk remaining after appropriate controls have been instituted.

5. Another goal is to clarify routes of exposure, attribute sources or stressors with ultimate effects, or endpoints. What is the cause of these risks? In addition, this exercise should allow us to develop useful indicators to assess the quality of the bays and to identify data gaps.

IIB. COMPARATIVE RISK ASSESSMENT OVERVIEW: USING RELATIVE RISK TO SET PRIORITIES FOR THE BAYS

(Abridged Text of Matt Liebman's presentation)

Introduction and Background

In 1991, when MBP began developing its workplans, including its 5 year workplan, we had difficulty trying to determine what our priorities were. We had just signed the Conference Agreement, which listed 6 priority problems, we were in the middle of several scientific studies funded by the MET, which focused on understanding the sources, transport, fate and effect and we were talking about producing a CCMP by the end of the year. It seemed fitting that we should undertake some sort of exercise to somehow rank all the problems Mass Bays faces, that would be appropriate for us to tackle, and set up a method to target a subset of them.

The MBP undertook this effort to compare risks to humans and to the ecosystem in order to better focus its efforts. Understanding and comparing risks is essential because it determines which problems are the most pressing, and which are not. In these days of limited budgets, it is essential to be proactive rather than reactive in environmental planning. Available resources to preserve, protect, and restore the environment are finite.

The TAC briefly made an effort to compare risks. It held a small workshop on comparing risks as part of a Scientific Workshop in 1991. Ultimately, the MBP decided to allocate some money to this effort and we enlisted the aid of a consulting firm with some experience in comparing risks. The process of comparing risks yielded information of value to the program, including a framework of understanding risks and a list of priorities.

As part of today's workshop, including the breakout session later, I will give an overview of our comparative risk project. The result was a report entitled "Relative Impact Assessment for Massachusetts Bays". This report was prepared with input from MBP staff with some assistance from Drs. Judy Pederson and Bill Robinson. It has been reviewed by TAC members as well as outside experts.

The reviews have demonstrated to me the limitations of the report as it stands now. They also demonstrated some of its strengths. In the breakout session, we will get into more detail on the results, and will ask for important information to characterize the risks, or problem areas, specifically information on the severity of the hazards and assessment of exposure. My goal will be to present the general results, or rankings and discuss the important reasons for each problem area's ranking. The exercise will be in the form of a "straw man". The result will be to re-rank, and if necessary, re-define, the problem areas. Let's add more information to clarify the absolute risks. For instance, provide information on hazards (toxicity) and most importantly, exposure (which includes an understanding of transport, fate).

Public Involvement

Priority problems in MET-MBP led to six priority problems articulated in the 1990 Conference Agreement. These problems evolved out of a public workshop held in 1988 (or 1989?) during the establishment of the MET-MBP. These included:

- Improve the habitats of living resources in the Bays.
- Protect public health by minimizing risk from environmental contaminants.
- Protect and improve water and sediment quality.
- Enhance the aesthetic quality of Massachusetts' coast and coastal waters.
- Encourage pollution prevention and other environmentally and fiscally sound methods of treatment, cleanup, and restoration.
- Improve access, educational, and appropriate recreational opportunities in and around the waters of Massachusetts and Cape Cod Bays.

The TAC at its Science Workshop in February, 1991, briefly debated comparative risks. There seemed to be general agreement that in terms of human health only, risk of pathogen contamination (swimming, shellfish) outranked risk of cancer or chronic illnesses resulting from ingestion of contaminated seafood, or from PSP. This was based on sheer numbers of people exposed--far more people would get sick from swimming/shellfish than from contaminated seafood. In addition, consensus was that more uncertainty in the latter exists.

The 1991 CCMP further refined these problems in terms of use impairments, e.g. living resources cannot use the estuary because of highly contaminated sediments, or humans cannot eat the fish because of high contaminant levels. The four broad categories of priorities were 1) public health, 2) living resources and habitat 3) public access and 4) aesthetics.

Today's exercise continues this discussion. Our goals here are to set priorities, and set up a process to determine measurable goals to achieve improvement in environmental quality of Massachusetts and Cape Cod Bays, i.e. reduce risks to the ecological and human users of the Bays.

How the Principles of Risk Assessment were applied to Mass Bays

Exposure is defined as "Exposure of individuals or populations to hazardous materials or situations"

Ecological risk is defined as follows: "Adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors" (EPA, Framework for Ecological Risk Assessment).

This highlights two factor of risk assessment: understanding of exposure and its pathways, and understanding of hazard -- toxicity, potency, harm, etc.

For example, the risk of serious injury from getting hit by a car is determined by two factors -- exposure to moving cars (how many times you jaywalk) and type of injury suffered (sore wrist or punctured lung from fractured ribs).

(The risk of a dinosaur eating you is determined by exposure to islands capable of supporting dinosaurs, probability of dinosaur cloning from ancient DNA, and probability of dangerous behavior elicited by cloned dinosaurs.)

Similarly, the risk of cancer from eating contaminated fish is a product of hazard (toxicity of chemicals found in fish flesh) and exposure (how many times one eats fish, what is the concentration of chemicals in the fish that one eats)

The risk of salt marshes in Mass. Bays becoming degraded is a product of hazard (the effect of runoff on salt marsh function) and exposure (frequency of developments near salt marshes increasing impervious surface).

Data Sources and Analysis

In assessing risk to public and ecosystem health, it is necessary to understand the extent of the exposed population, the dose, or concentration of the contaminant or pathogen to which the population is exposed, and the relative severity of illness caused by the contaminant or pathogen. These are common elements of standard risk assessments. For ecosystem health, one needs to understand relative severity, areal extent and species affected for each problem area. Indicators, such as "status of exploitation" of finfish, were used to provide estimates for these criteria. To acquire this information, the MBP and its colleagues from the MWRA, MIT Sea Grant, etc. have gathered information on the routes of exposure of contaminants to the bays. The following table indicates the types of information and criteria used to compare and rank risks to Mass Bays.

CHARACTERIZATIONOF RISK: (POPULATION, NOT INDIVIDUAL RISK)

	HAZARD	EXPOSURE
HUMAN HEALTH		
	SEVERITY OF DISEASE	
	TOXICITY OF CHEMICAL	
	NUMBER OF EXPECTED CASES	
	POTENTIAL POPULATION EXPOSED	
ECOSYSTEM HEALTH		
	SEVERITY	
	AREAL EXTENT	
	REVERSIBILITY	
	NUMBER OF SPECIES AFFECTED	

Problem Areas

For each *problem area (or potential risk)*, an *endpoint*, *stressor*, and *indicator* are considered. An endpoint is the specific effect or impact of concern. A stressor is the contaminant source or cause of insult. For example, one endpoint is the risk of acquiring gastroenteritis from incidental ingestion of contaminated seawater. The stressors include poorly functioning sewage treatment plants, CSO's, and non-point source runoff. The indicator used to gauge the extent of this problem is the number of beaches closed due to fecal coliform counts exceeding standards.

In the following two tables, I have ranked risks for both human health and ecological health. In both cases, the top two problem areas outranked the remaining problem areas. This is because of the multitude of chemical compounds found in tissue and sediments posing risks to both human and living resources health (see following two tables).

HUMAN HEALTH PROBLEM AREAS

ENDPOINTS	STRESSORS	INDICATORS
CANCER RISK FROM INGESTION OF CONTAMINATED SEAFOOD	ORGANICS (PCBs, PAHs) IN FISH TISSUE, ACCUMULATED FROM A VARIETY OF POINT AND NONPOINT SOURCES	CONTAMINANT CONCENTRATIONS IN FISH TISSUE (FLOUNDER, LOBSTER, SHELLFISH)
NON-CANCER (TOXICITY-RELATED) ILLNESSES FROM INGESTION OF CONTAMINATED SEAFOOD	METALS (As, Pb, Cu) IN FISH TISSUE, ACCUMULATED FROM A VARIETY OF POINT AND NONPOINT SOURCES	CONTAMINANT CONCENTRATIONS IN FISH TISSUE
GASTROENTERITIS FROM INGESTION OF CONTAMINATED SHELLFISH	VIRUSES FOUND IN SEWAGE FROM BOTH POINT AND NONPOINT SOURCES	FECAL COLIFORMS, ENTEROCOCCUS COUNTS, NUMBER OF SHELLFISH BEDS CLOSED
GASTROENTERITIS FROM INCIDENTAL INGESTION OF CONTAMINATED SEAWATER	VIRUSES FOUND IN SEWAGE FROM BOTH POINT AND NONPOINT SOURCES	FECAL COLIFORMS, ENTEROCOCCUS COUNTS, NUMBER OF POSTED BEACH CLOSURES
PARALYSIS (DEATH) FROM INGESTION OF PSP CONTAMINATED SHELLFISH	ALGAL BLOOMS (RED TIDES) TRANSPORTED INTO MASS BAYS, POSSIBLY EXACERBATED BY NUTRIENT ENRICHMENT	PSP CONCENTRATIONS IN SHELLFISH TISSUE, CLOSURE OF SHELLFISH BEDS

ECOSYSTEM HEALTH PROBLEM AREAS

ENDPOINTS	STRESSORS	INDICATORS
CONTAMINATION OF SEDIMENTS	CHEMICALS (METALS AND ORGANICS) FROM A VARIETY OF POINT AND NONPOINT SOURCES	CHEMICAL CONCENTRATIONS IN SEDIMENTS
CONTAMINATION OF WATER COLUMN	CHEMICALS (METALS AND ORGANICS) FROM A VARIETY OF POINT AND NONPOINT SOURCES	CHEMICAL CONCENTRATIONS IN WATER COLUMN
CLOSURE OF SHELLFISH BEDS	PATHOGENS AND CONTAMINANTS FROM POINT AND NONPOINT SOURCES	PATHOGENS, ACREAGE OF SHELLFISH BEDS CLOSED
HEALTH OF LIVING RESOURCES	CONTAMINATION FROM SEDIMENTS, FOOD CHAIN EFFECTS, ULTIMATELY DERIVING FROM POINT AND NONPOINT SOURCES	DISEASE IN WINTER FLOUNDER
LOSS AND ALTERATION OF HABITAT DUE TO SEA LEVEL RISE	SEA LEVEL RISE	ANNUAL ACREAGE LOST
DECLINE IN FISH DIVERSITY	OVERHARVESTING	STATUS OF EXPLOITATION (NMFS)

Results

The results are presented in a qualitative fashion, because there were several criticisms from reviewers about the approach, the model and the data used to generate the results. Therefore, the results were presented as a straw man to generate discussion and, if possible, draw conclusions.

As you can see from the results, the highest ranking risks were related to cancer and non-cancer risks of eating seafood. This resulted from the number of potential compounds present in seafood -- lead, arsenic, copper, DDT, PCB's, and PAH's.

Although not ranked as high, the risk of gastroenteritis is potentially very high. Up to 13,000 cases may occur in Mass Bays annually.

Based on estimates from the DMF, it was felt that the risk of acquiring gastroenteritis from contaminated shellfish is probably low, about 1500 cases per year.

For ecological health risks, nearshore sediments contain a long list of potentially toxic compounds at high levels, such as chromium, zinc, lead, PCB's, PAH's, and DDT. Because sediments accumulate chemicals and are relatively slow to recover, this risk ranked high. Similarly, chemical compounds in the water column ranked high because of the number of compounds found.

Closure of shellfish beds did not rank high because time to recovery judged to be short-term. Nevertheless, estimates from the DMF include up to 72% of nearshore shellfish beds are restricted from harvesting for one reason or another.

Health of living resources also did not rank high because significant flounder disease found only in certain nearshore areas near Boston. However, this category lacked sufficient data.

MBP PROJECTS

How do the results of the risk assessment compare to our ongoing activities? What are our own priorities based on our activities in research, demonstration projects, technical assistance, public education, and data management?

RESEARCH

REFINING LOADINGS ESTIMATES

> Atmospheric Deposition of contaminants: organics, metals, nutrients

> Nonpoint source runoff of organics

> Merrimack River as a source of organics

LINKING HUMAN ACTIVITIES TO EFFECTS ON LIVING RESOURCES

> Exposure of Fundulus to organics as measured by cytochrome induction

> Sediment Quality Triad approach for assessing sediment quality -- effects of organics, metals on biotic community, and assessment of toxicity

NUTRIENT CYCLING

> Controlling factors of primary production in Cape Cod Bay

SEDIMENT ORGANICS

> Measurements of organics in sediment cores (with MWRA/USGS)

MINI-BAYS

PLUM ISLAND SOUND/RIVERS

> pathogens, nutrients, living resources, land use

WEYMOUTH FORE RIVER

> pathogens, sediment contamination, assessment of health risks from shellfish consumption, growth management

WELLFLEET

> nutrients, living resources, economic value

DEMO PROJECTS

CONTROLLING NON-POINT SOURCE POLLUTION (PATHOGENS) FOR PROTECTION OF SHELLFISH BEDS

- > Gloucester
- > Quincy (also swimming beaches)
- > NSRWA
- > Barnstable (also toxics)
- > Bluefish River

PHYSICAL RESTORATION OF HABITAT

- > Boston Harbor Islands Restoration Project
- > Lewis Lake restoration
- > Pilayella

CONTROLLING NUTRIENT ENRICHMENT OF EMBAYMENTS

- > Alternative Septic System

TECHNICAL ASSISTANCE

PROTECTION OF SHELLFISH BEDS AND LIVING RESOURCES THROUGH:

- > Citizen monitoring for pathogens
- > Identifying point and nonpoint sources of pollution
- > Controlling stormwater runoff

DATA MANAGEMENT

- > Mapping
- > Wetlands Conservancy Program

What Risks or Problem Areas, in Rank Order, are we Tackling now?

1. Protection of shellfish beds from pathogens through control of nonpoint source pollution. Our efforts will open up more shellfish beds and prevent beds from further degradation.

2. Protection of sediment quality through control of nonpoint source pollution of contaminants, specifically organics. Our efforts will contribute to an understanding of what is the sediment quality necessary to support living resources? The information we are gathering will help us in our goal is to reducing pollution to acceptable levels on a bays-wide and embayment level scale, to help set sediment criteria, which would help us manage dredging projects, etc.)

3. Assessing the health of our living resources, coming up with indicators for monitoring

4. Protecting embayments (and Bays) from eutrophication through control of nonpoint (septic systems) and point sources

5. Restoration of important degraded habitats

6. Mapping resources

What Risks or Problem Areas are we not Substantially Addressing?

Risk of degradation of sediment and living resources from point source pollution

Risk of increase in PSP from specific point sources of nutrients

Risk of degradation of fish and other living resources from contamination from radioactive and toxic barrels historically dumped in Mass Bay

Risk of loss of important fish species caused by overfishing

Risk of loss of habitat from sea level rise

Risk of loss of habitat and public property from storms, improper development on barrier beaches

Risk of degradation of living resources from low freshwater flow

Risk of accidental releases, such as oil spills

WHAT DO WE KNOW FROM RECENT RESEARCH?

Here are some key results from the last year or so that may inform our risk assessments.

1. Higher toxics in atmospheric deposition and some rivers than predicted in Menzie-Cura, 1991, but Menzie-Cura, 1991 was in the right ballpark for many loadings. Logan Airport may be a significant source of PAHs. Dry deposition of PAHs very important locally.

2. Fewer levels of toxics in some point sources.

3. Embayments still polluted (Fore River).

4. Nitrogen may not be a problem in a well-flushed embayment such as Plum Island Sound. The jury is still out for Wellfleet Harbor.

5. Some groundfish are becoming depleted, and there are indications that some of the smaller fish, such as Fundulus, are also becoming depleted. However, there are still many shellfish and fish still abundant--lobster, striped bass.

6. Cape Cod Bay is quite different from Mass. Bay in many physical and chemical oceanographic respects. For instance, CC Bay may be more separated from Mass. Bay than previously thought.

III. MORNING CONCURRENT BREAKOUT SESSIONS SUMMARIZED

A. COMPARATIVE RISK: FOLLOW-UP DISCUSSION OF METHODOLOGY, RESULTS AND DATA GAPS

A workgroup formed after the plenary presentation on the comparative risk project approach and results. Many members of the workgroup had read the report so were familiar with some of the issues and criticisms of the project. Many of these issues were reiterated at the beginning of the discussion. For example, one of the problems of the risk assessment is that it was biased in favor of problem areas which included more data. Problem areas which utilized more data often exhibited higher risk rankings. The workgroup suggested other sources of data which might be useful, for instance, the recent National Academy of Sciences Seafood Safety report should be consulted.

In addition, the workgroup was dissatisfied with the groupings--there seemed to be no category of sustainable resources. They favored a revision of the problem areas defined above. Rather than use two broad categories of risk, the group favored categorizing problem areas into three major groupings:

1. risks to public health;
2. risks to habitat quality; and
3. risks to sustainable resources.

In this grouping, risks to public health would include ingestion of contaminated seafood and would not change significantly. Risks to the ecosystem would be categorized as risks to habitat quality. A major stressor of habitat quality includes coastal development. Risks to sustainable resources, such as shellfish beds or fisheries, would include non-point source pollution and overharvesting.

The workgroup also proposed that it can achieve the most reduction in risk by concentrating on two major issues: 1) controlling non-point source pollution causing pathogen contamination of shellfish beds, and 2) preventing degradation of habitat quality from two major sources--coastal development and discharges of toxics to the bays. However, no particular toxics were determined as posing the most risk to the Bays. The key point was that these actions would probably yield reductions in risk in many categories--health, habitat, and sustainable resources.

Included in the appendices is a table showing relative risk rankings from the Risk Assessment study (see also the "Summary of Work to Date" in the appendices.) The breakout discussion focused on the weaknesses in the approach used, particularly in regards to the framework for evaluation. The framework used produced inherent biases and was too arbitrary in scoring. Not all pertinent data sources were considered in developing the scoring.

The participants in the discussion agreed that the basic framework should be amended to include three categories: Human Health, Ecological Risk, and a new category Risk to Sustainable Resources.

III B. RESOURCE MANAGEMENT ISSUES CONFRONTED AT THE STATE AND LOCAL LEVELS

Two morning breakout sessions concurrently addressed the same series of questions. The questions and a combined summary of the responses are given below:

Who is responsible for resource management?

Discussion on this issue acknowledged that a wide spectrum of agencies on the state and federal level are responsible for resource management (including the Massachusetts Executive Office of Environmental Affairs agencies, EPA, Army Corps, NOAA, National Marine Fisheries Service, US Fish and Wildlife Service, National Marine Fisheries Service and the US Dept. of Agriculture). On the local level, a wide spectrum of local agencies were cited, along with citizen groups, user groups, educators and individual recreators. The diversity of the responsible players underscores the need to coordinate with and involve all the organizations and individuals who are directly involved in managing our coastal resource in the process of developing a coordinated plan for the bays.

What are the barriers to successful resource management?

The obstacles that we must surmount in order to implement sound resource management could be summarized as follows:

lack of funding, lack of economic incentives

lack of public education and information transfer leading to a lack of political will, failure to develop a coastal ethic

lack of agency coordination and enforcement

The Massachusetts Bays Program is directly addressing these issues through financial planning, education and information transfer, and by bringing the key agencies to the same table. The questions remains - what more could we be doing to minimize these obstacles.

What tools are needed for successful management?

The tools for successful management directly address the barriers defined above. They are:

funding, economic incentives

education, technical assistance, setting measurable goals, building a coastal constituency

collaboration between government and non-profits, leadership

The Nashoba Associated Boards of Health legislation was highlighted as a positive example of state assistance being used to enhance local/regional capacity to manage resources through technical assistance. The Massachusetts bays Program has recently funded technical staff assistance for each of the five coastal regions, which we hope will become institutionalized in the future through the regional planning agencies.

What are some strategies for success?

Key concepts that came out of this subject area were:

identifying an appropriate scale for identifying and managing problems administrative support for natural system-based management)

collaborative, comprehensive regional/watershed management planning

setting observable goals, drinkable/swimmable/harvestable waters

coordinated/cooperative use of education/technology/resources

developing a sense of ownership/investment in the resource

Mass Bays Program leadership role/involvement of the Secretary

Several follow-up suggestions were addressed to state agencies, i.e., synthesize and transfer information, collaborate with nonprofits, and establish regional offices which would house representatives from each of the agencies under one roof.

Where will the money come from?

In addition to suggested use of taxes, fees, direct appropriations, loans and grants, citizen fundraising, there were a few innovative suggestions:

voluntary check-off

public/private partnerships

development of economic incentives

Eco-bonds

All of these ideas should be explored as part of the Massachusetts Bays Program's financial planning effort.

IV. AFTERNOON CONCURRENT BREAKOUT SESSIONS SUMMARIZED

All four afternoon breakout sessions addressed the same series of questions. The questions and a combined summary of the responses are given below.

Question 1: What criteria should be used in setting priorities for action?

Several common themes ran throughout this discussion, including identifying and addressing publicly perceived problems to build public investment in the program. Other criteria included likelihood of success, relative risk, economic cost/benefits, prevention versus restoration availability of funding, public health and habitat improvement, ability to tie-in to existing programs, appropriate scale of action, and short-term visible results.

Question 2: At present, what are the priority issues?

Among the issues identified as priorities were:

-an ecosystem approach to pollution prevention

-public health (swimming and seafood safety)

-habitat quality

-useable resources (e.g., shellfish beds)

-management of stormwater and point source discharges

Question 3: Are there issues we have overlooked or that need more attention?

Issues discussed included:

-financial planning

-land use management

-regionalization, embayment level management

-communication, particularly among regional groups and outside coalition groups

-cumulative impacts, systems approach to permitting

-source reduction

-marketing the program

Question 4: What issues should the MBP be most closely identified with?

Two common themes arose in the groups discussions: addressing pathogen pollution of shellfish beds and taking a regional/watershed approach to resource management.

Other issues raised included:

-toxics

-nutrients

-taking a non-anthropocentric approach (addressing wildlife/habitat issues)

-finfish (open ocean water quality, wildlife management)

Two marketing ideas that came out of the discussions included a Mass Bays Program mascot and a "Save the Animals" Campaign.

One of the groups produced a vision of the future of the Bays as a goal statement: They stated that we want "to have an ecosystem close to what the Indians had; to have a healthy environment for people, whether swimming or consuming seafood; and to have a healthy marine economy."

Question 5. How do we set achievable, measurable goals within our priority areas?

Question 6: What steps do we need to achieve our goals?

Question 7: How do we measure success?

Several of the breakout sessions approached the three questions above in combination. In summary, the following ideas emerged from the discussions:

Setting measurable, achievable goals

Suggested "how to" approaches for setting and validating measurable goals included holding regional meetings and hearings (coordinated with the LGC's), analyzing technical information and circulating it to the public, working with agencies, legislators and the scientific community to validate our goals, and building a constituency to support the goals.

Two of the groups approached the questions from the perspective of specific priority areas: Three main concerns emerged: **pathogens, toxics, and nutrients, all of which enter the system via point and nonpoint sources**.

Toxics reduction could be addressed by setting maximum or average target concentrations for chemicals of concern in sediments or tissues over specific areas. Targets should be set for percent reduction of loadings by a given year. Point and nonpoint sources and contaminated areas should be identified, available standards evaluated and standards set where needed. By better management of point source discharges, cumulative loading limits could be set within three years. It was suggested that the current point source permitting program could be revised to incorporate cumulative loading limits within five years. In terms of stormwater management, the Mass Bays Program should coordinate the development of a stormwater management policy which would integrate stormwater management into state and local roadway design within two years. In addition, the Mass Bays Program should develop model municipal zoning bylaws/ordinances on stormwater management within the next year. The technical and financial feasibility of reduction strategies should be evaluated.

Nutrients could be addressed by setting a target for reduced nutrient loading in sensitive embayments by a given year. The Massachusetts Bays Program should identify nutrient sensitive embayments and work towards setting standards. The point source and nonpoint source toxics reduction strategies described above could also be applied to reducing nutrient loads.

In terms of **pathogens**, it was suggested that the Mass Bays Program set target percentages for increased acreage of shellfish beds over a set timeframe. This could be accomplished by increasing the number of people involved in monitoring shellfish beds, encouraging faster, more reliable, on-site testing for pathogens, protecting existing shellfish beds (e.g. protection of wetlands), installing boat pumpouts, and evaluating sanitary surveys to identify areas that can be targeted for opening. The stormwater management strategies described above could also be applied to reduction of pathogen inputs.

Steps to achieve our goals

Additional suggested strategies for achieving our goals included the following:

-coordination of Mass. Bays Workplan with other agencies (where possible, Mass. Bays Program should provide leadership and coordination for projects and programs (e.g. regional collaboration with DMF for storm drain remediation)

-increased media relations

-legislative lobbying

-regional outreach

-develop and employ appropriate tools for success (bylaws)

-market established programs

-maintain a regional focus, but target most affected areas

Suggested financial strategies included:

-public/private partnerships

-Using 604B as a model for state pass-through money

-dissemination of cost/benefit information

Measuring success

It was suggested that our success will be indicated by our level of public support and our success at acquiring funding. Other suggested measures of success include monitoring data which indicates improvement in environmental quality, uninterrupted continuation of our CCMP actions, and institutionalization of the Massachusetts Bays Program within non-profit and private agencies.

Question 8: How do we focus our efforts?

This question led to some suggested steps for the Mass Bays Program to undertake:

-Develop a workable, realistic CCMP!

-Recognize the importance of public awareness and participation

-Explore decentralizing governance

-Implement programs on a regional or watershed level

-Redefine boundaries (watershed versus political)

-Work with municipalities to get bylaw changes, address septic system problems

-Work with state and federal agencies to address point and nonpoint source pollution

Question 9: Why should agencies/communities work with the MBP?

Each of us needs to understand why and how the Massachusetts Bays Program can and does play an important role in preserving and protecting our coastal resources. Below is a summary of the responses to this question:

-networking and coordination with state/federal/local agencies

-access to technical information

-local technical assistance, commitment to helping solve local problems

-cost-effective coordinated approach, financial planning, funding

-provides an opportunity for agencies to set, achieve and further their agendas

-provides a unified voice on coastal resource issues

-commitment to citizen/research community involvement

V. CONCLUSIONS

While the discussions explored the length and breadth of Massachusetts Bays Program activities and goals, a few broad themes were echoed in discussions throughout the day. There seemed to be general agreement that pathogen contamination of shellfish beds and beaches is a high priority as well as a high profile issue. Setting target goals for shellfish bed openings should be a program priority. Discussions also focussed on setting measurable target goals for reduction of toxics and nutrients entering the marine environment. Protecting the health of the both the public and the ecosystem was stressed.

These goals can be met through collaboration of state and federal agencies and local commmunities, by rallying public support for remediation efforts and monitoring, and by working at the watershed or embayment level. Developing coordinated regional approaches to improving water quality emerged as a key issue for the Massachusetts Bays Program.

In the coming months, we face the dual challenges of developing the measurable goals discussed at the Visioning Workshop, and of generating the public constituency we need in order to achieve our goals.

APPENDIX 1

NOTES FROM THE MORNING RESOURCE MANAGEMENT BREAKOUT SESSIONS

APPENDIX 1A. Session Facilitator: Alan Hankin

Question 1: Who is responsible for resources management?

* indicates key organizations

- State Agencies

  DMF *
  CZM
  MWRA
  DEP *
  DFWELE *
  DEM *
  MDC
  Mass. Dept. Food and Agriculture *

- Federal Agencies

  U.S.Dept. of Agriculture
  Army Corps of Engineers
  EPA *
  NMFS *
  USFWS *
  USGS *
  MBP

- Local Agencies/Organizations

  Regional Planning Agencies
  Sanitary Districts
  Cape Cod Commission *
  Non Governmental Organizations *
  Citizen Groups *
  North River Commission
  Conservation Commissions
  Health Boards *
  Local Planning Boards
  Harbor Planning *

APPENDIX 1A continued

DPWs
Watershed Planning
Shellfish Constables
Harbor Planning
Selectmen
Parks and Recreation Depts.
Media
User Groups *
Educators
Business and Industry
Shellfish/Fishery
Boaters
Recreators

Question 2: What are the barriers to successful resource management?

- Parochial attitudes
- Lack of coordination of resource management
- Too many players
- Media
- Regulations + environmental policy
- Lack of Education
- Not enough players
- " " money
- " " enforcement
- " " planning
- " " education
- " " measurable goals
- " " consensus
- " " flexibility
- Too much enforcement
- Too many people/directions
- " " perspectives
- " " problems
- Politics
- Overpopulation

Question 3: What are the tools needed for successful management?

* key tools

- cooperation - agencies/people on a goal *
- measurable, agreed upon goals & objectives *
- leadership *

- the right people at the local level
- prevention
- prioritization
- management systems to reach goals
- media *
- education *
- structures
- money
- uniformity
- political will/action *
- water-resource based planning
- regulation
- GIS Mapping
- monitoring DATA
- innovative Technologies
- communication
- organization

Question 4: What are some strategies for success?

* key strategies

- coordinated/cooperative use of education, technologies, management, money, resources to identify problems at scale of natural systems *
- identify scale to work on
- identify appropriate scale
  manageable people/space/level of resource
  limitations on management
- get people to identify with the resource/scale/management *
- agreed upon observable goal *
- develop sense of ownership/investment/importance *
- tap the public's concerns/interests/motivation

APPENDIX 1A continued

"Usable" waters (we can afford) drinkable/swimmable/harvestable

MBP becomes leader/coordinator --> creator of leadership/coordinator *

Pitfalls - level of management
science

Question 5: Where will the money come from?

(I) = money into the Program to fund activities
(N) = money out to the communities, etc.

(I) Taxes on General Public
(I) User Fees
(O) Appropriations (Legislative)
(I,O) Use what we've got better/differently
(O) Loans/Grants
(I) Voluntary Check-off
(I) Citizen Fundraising
(I) Private Foundations
(I,O) Reinvestment
(O) Business/Government Partnerships
(I) We all will pay
(I,O) Use resources better
Cost/source reduction
Pollution prevention
(I) Eco-Bonds
(I) Revolving Fund Promotions

APPENDIX 1B. Session Facilitator: Jack Clarke

Question 1: Who is Responsible for Resource Management?

- Local
  - Con Comm's
  - Boards of Health
  - Planning Boards
  - Zoning Boards
  - Boards of Selectmen
  - Harbormasters
  - Shellfish Department
  - Regional Planning Agencies
- State
  - EOEA & agencies
  - DEP, DMF, DFWELE
- Federal
  - EPA
  - Army Corps
  - NOAA

Question 2: What are the Barriers to Successful Resource Management?

- Money
- Too many agencies
- Overlapping jurisdictions
- No link between state & local, local & local
- Home rule powers
- Tax inequities
- Lack of incentives for resource management, particularly as it relates to laws governing subdivision of land
- No transfer of existing information/lack of accessibility
- Lack of public involvement
- Lack of environmental ethic
- Lack of consistent enforcement
- Lack of coordination
- Economic self interest
- Cumulative impacts: need for understanding
- Lack of economic assessment info in decision making, and lack of info on value of resources

APPENDIX 1B continued

Question 3: What are the tools needed for successful management?

- Money
- Economic incentives/internal costs and benefits
- State assistance to develop local and/or regional technical assistance capability (Nashoba Associated Boards of Health legislation was mentioned as a good example of effort)
- Shared technical professionals among regions
- Transfer of data & information/timely access to information
- Build constituencies (nonprofits-government)/collaboration

Question 4: What are some strategies for success?

- Decentralize government
- Natural systems approach
- Collaboration between government and nonprofits
- Establishment of regional compacts to provide professional staff to local govt.
- Proactive, long-term, comprehensive planning
- Strengthen regional/watershed approach to resource management
- Integrate issues
- Empower sub-state groups

Question 5: Where will the money come from?

- Reallocate existing funds
- Recruit volunteers
- Economic incentives
- User fees
- Impact fees
- Public/private partnerships

Addendum: Next Steps

The consensus of the group on the most important next steps to pursue were:

1. Education
2. Foster natural systems approach
3. Endorsement by Secretary

Addendum: Recommended state agency actions:

1. information synthesis and transfer
2. collaboration with nonprofits

3. regional focus of state agencies, using MCZM regional model, even suggested regional offices house staff from different agencies rather than each having own space.

Addendum: Implementation:

- Administrative support for natural system-based management

APPENDIX 2

NOTES FROM AFTERNOON BREAKOUT SESSIONS

APPENDIX 2A. Facilitator: Alan Hankin

Question 1: What criteria should be used in setting priorities for action?

- Improve public health
- Improve habitat quality
- Use of (exploitable/sustainable) resources
- (High) likelihood of success within time frame and resources
- Clear goals
- Public perception (of a problem)
- Public support
- Public identification/"usable" waters
- Greater public benefit
- What scale should we use per problem?
- Economic cost/benefits
- Can it be done at our level?
- Can it take us to people as a part of the natural world; not apart from it?

Question 2: At present, what are the priority issues?

- Public health:
  - swimmable waters (?)
  - seafood safety
  - coastal development - health and safety localized

- Habitat quality:
  - wetlands protection/enhancement and management
  - wildlife management
  - beaches/dunes
  - open water management (Outfall; Stellwagen)
  - baby fish/micro-layer/nurseries

- Use of resources:
  - shellfish (health, acreage, monitoring)
  - watersheds: use of land/resources/landscape ecology
  - finfish
  - recreational/commercial coastal use and use of waters (tourism)
  - the ocean as sink

APPENDIX 2A continued

Question 3: Are there issues we have overlooked or that need more attention?

combined with:

Question 4: What issues should the MBP be most closely identified with?

Focus program efforts on the use of resources, i.e., something the public understands
- shellfish resource protection and enhancement (wetlands, seafood safety, coastal development)
- finfish (open ocean water quality, wildlife management)
- design the program to be non-anthropocentric
- landscape ecology

Question 5. How do we set achievable, measurable goals within our priority areas?

combined with:

Question 6: What steps do we need to achieve our goals?

combined with:

Question 7: How do we measure success?

- Focus on identified actions (recipients, implementers, ID target audience)
- Build constituency for solution
- Decide on appropriate scale
- Develop, employ appropriate tools (by-laws)
- Translate information from technical reports into publicly understandable/acceptable action
- Make sure training relates to resource protection
- Estimate costs and let people know what the benefits are from actions
- Market established programs
- Identify and support programs and projects which allow for the Program to provide leadership/coordination/saving of resources/synergy/clearinghouse
- Find and distribute money, but also assist others in that effort
- Regional focus, but aim at the regions most affected by the resource problem

APPENDIX 2B. Facilitator: Andrea Cooper

Question 1: What criteria should be used in setting priorities for action?

The group felt it was important to establish a long-term strategy that starts with short-term visible, tangible results. Criteria should focus on meeting public priorities to build public investment in the Program.

Question 2: At present, what are the priority issues?

- Pollution prevention
- Eco-System approach
- Implementation
- Public investment (to implement goals)
- Education and outreach (more of this to lead to public investment)
- Equal marriage of social and scientific issues in order to achieve the priority of implementation.

Question 3: Are there issues we have overlooked or that need more attention?

- Regionalize the Program-stress the embayment approach
- Develop a coalition approach to program building
- Maintain communication among regional groups and committees (internal) and outside coalition groups
- Marketing
- Financial planning
- Reality/validity check

Question 4: What issues should the MBP be most closely identified with?

- Pathogen contamination-clean beaches, opening shellfish beds, edible fish
- Regional Approach

Question 5. How do we set achievable, measurable goals within our priority areas?

- Regional input/meetings, hearings (through LGCs)
- Information analyzed and recirculated back to the public
- A "safety check" with regulatory agencies, legislators, and scientific groups
- Logic

Question 6: What steps do we need to achieve our goals?

- Increase media relations
- Effective coordination
- Provide regional support
- Institutionalize workplans (bring elements of the MBP into other existing frameworks/gov. agencies)
- Legislative lobbying
- Improve regional outreach
- Develop public/private partnerships
- Work with EPA to assure state accountability through funding
- Use 604B as a model for pass-through money

Question 7: How do we measure success?

- Public support/funding
- Recorded scientific data
- Uninterrupted continuation of CCMP actions
- Program institutionalized w/in non-profit and private agencies

Question 8: How do we focus our efforts?

- Develop a CCMP based in reality (workable!)**
- Recognize the importance of public awareness and participation
- Implement programs on a regional level
- Focus on tangible, visible projects
- Implement financial planner's efforts
- Explore decentralizing governance

(**most important!)

Question 9: Why work with the MBP?

The MBP provides:

- cost effective approach
- funding
- agencies opportunities to set, achieve and further their agendas
- good PR opportunities
- opportunities for tech transfer/data exchange
- opportunities to enhance professional credibility (of personnel in an agency)

APPENDIX 2C. Facilitator: Patricia Hughes

Question 1: What criteria should be used in setting priorities for action?

- Those listed on agenda (likelihood of success, public perception, relative risk, economics
- Scale of action
- Likelihood of funding
- Timeframe for action
- Implementation
- Coordination with existing programs, i.e., harbor planning, sanitary surveys
- Local comprehensive planning
- Clear message in action
- Important for public to understand what can be accomplished and when.

Question 2: At present, what are the priority issues?

- Management and enforcement of point source discharges
- Water quality monitoring--habitat quality--economic loss (e.g., shellfish beds)
- Stormwater management

Question 3: Are there issues we have overlooked or that need more attention?

- Cumulative impact assessment
  in particular: systems approach to permitting
- Land use management practices
  examination of changes at the edge of the water
- Source reduction - education and remediation

Question 4: What issues should the MBP be most closely identified with?

- "To have an ecosystem close to what the Indians had."
- "To have a healthy environment for people, whether swimming, or consuming seafood."
- "To have a thriving marine economy."

Question 5. How do we set achievable, measurable goals within our priority areas?

No "how to" discussed, but rather a statement of goals:

- Better management of point source discharges;

APPENDIX 2C continued

- Improve stormwater management at state and local levels
- Open and maintain open shellfish beds

Question 6: What steps do we need to achieve our goals?

combined with:

Question 7: How do we measure success?

- Better management of point source discharges:
  - set cumulative loading limits for particular pollutants within 3 years.
  - revise current permitting program to incorporate cumulative loading limits within 5 years.
- Improve stormwater management:
  - MBP coordinate the development of a stormwater management policy, the purpose of which is to integrate stormwater management into state and local roadway design to protect the environment, and public health and safety. MBP to advance policy within 2 years.
  - develop model municipal zoning bylaw/ordinance on stormwater management within 1 year.
- Open and maintain shellfish beds:
  - set goal of opening (x) acres of shellfish bed/region in (x) years.
  - continue to evaluate sanitary surveys to keep identifying acreage each year that should be targeted for opening.

Question 8: How do we focus our efforts?

not addressed

Question 9: Why work with the MBP?

- Information exchange
- Technical assistance
- Coordinate with agencies
- Help solve problems
- Financial assistance
- Unified voice
- Pooling resources
- Establish network

APPENDIX 2D. Facilitator: Carol Kilbride

Question 1: What criteria should be used in setting priorities for action?

- Public support
- Public perception
- Information/data
- Likelihood of success
- Relative risk
- Economics
- Indicators
- Ecosystem integrity
- Public health implications
- Water quality
- Geographic scope
- Urgency/time sensitivity
- Useability
- Reversibility
- Effect on endangered species
- Prevention vs.restoration vs. re-creation
- Availability of funds

Question 2: At present, what are the priority issues?

- Public health
  - carcinogenic compounds in fish/shellfish
  - other toxic compounds with a non-cancer endpoint
  - gastroenteritis from shellfish consumption and from contact with contaminated water, red tide or PSP

- Ecosystem integrity

Question 3: Are there issues we have overlooked or that need more attention?

- Management structure
- Communication
- Funding

Question 4: What issues should the MBP be most closely identified with?

- Environmentally aware & politically active constituency
- Introduction of regional approach

- Pathogens/toxics
- Shellfish
- Mascot (MBP should get one)
- Idea: interrelated
- System of watersheds linked together
- "Save the animals" campaign
- Nutrients

Question 5. How do we set achievable, measurable goals within our priority areas?

combined with:

Question 6: What steps do we need to achieve our goals?

combined with:

Question 7: How do we measure success?

The group wrestled with 3 questions regarding goals (how to set them; what steps are necessary and how to measure success) by identifying some suggested measurable goals in general terms and some intermediate steps that are necessary to achieve them. Following is what the group developed in some different topic areas.

TOXICS

- Goals:
  - set maximum (or average) target concentrations for chemicals of concern in sediments and/or tissues over specific areas. May need interim short-term goals.
  - reduce the number of pathologies of winter flounder over a certain time period.
  - reduce the loadings of specific toxics by ___% by ____year.
    a. point sources
    b. nonpoint sources
- Intermediate steps:
  - identify sources (point and nonpoint)
  - evaluate fed/state standards when available
  - set standards where needed
  - evaluate technical and financial feasibility of programs
  - identify contaminated areas

PATHOGENS

- Goals:
  - increase acreage of harvestable shellfish beds by a set percentage per year by the Year 2000.
  - maintain/protect existing shellfish beds from contamination (i.e. increase of wetlands)
  - reduce loadings to shellfish beds from stormwater/septics/runoff.
  - each Region should have ___ number of pumpout stations.

- Intermediate steps:
  - faster, more reliable, less costly, on-site testing for pathogens
  - use of more personnel for monitoring

NUTRIENTS

- Goal: reduce nutrient loadings by ___% by ____ year in nutrient sensitive embayments.

- Intermediate Steps:
  - identify nutrient sensitive embayments
  - set standards

Question 8: How do we focus our efforts?

The group developed an initial list of how to focus efforts over the next 2+ years.

- Open shellfish beds by:
  - collaboration with state & local agencies
  - rallying of support around monitoring & remediation
- Tying 3 issue areas together (toxics, nutrients, pathogens)
- Work at the watershed or embayment level
- Redefining boundaries (political vs. **watershed**)
- Minibays programs based on **watershed** not embayment level
- Work through others to get into **watershed**
- Work with municipalities to get by-law changes and septic system changes
- Work with agencies on source and nonpoint source pollution

APPENDIX 2D continued

Question 9: Why work with the MBP?

- Info/data/money
- A forum where all of the agencies come together regularly
- "Piggy-backing" of resource/expertise to resolve problems - no one agency can solve the problems
- "Only integrated shown in town"
- Only program with formal citizen and university involvement
- Ability/commitment to **SOLVE** local problems